

A Study on Etio-Pathology of Proptosis in Otorhinolaryngology

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Abstract

Twenty cases which presented with proptosis during the period of 1 year at the Madras Medical College & Govt. General Hospital, Madras, India were taken up for this prospective study. After a detailed ENT and ophthalmological examination, exophthalmometric readings were done on all cases. The etiological causes and other factors were analysed. Malignancies and benign tumours and tumour like lesions were found to be the commonest cause of proptosis. Infections which were once responsible for most cases of proptosis formed only a very small proportion. A person presenting with proptosis as the only sign is most likely to suffer from a benign tumour or tumour like lesion while presence of other eye signs should raise the possibility of malignancies. The direction of proptosis was found to be more useful than exophthalmometric readings in determining the site of lesion.

INTRODUCTION

The orbit is an area of considerable interest to the Oto Rhino Laryngologist. Proptosis may be defined as a forward movement of the globe in relation to the skull and is generally measured by the protrusion of the apex of the cornea in front of the outer orbital margin while the eye looks straight ahead. There are very few studies on proptosis in otorhinolaryngology. This prospective study on proptosis deals with its aetiopathology and other aspects including exophthalmometric measurements.

The normal measurement varies within considerable limits, from 10 to 20mm, but the average value is slightly above 16 mm. Measurements in excess of this denotes some degree of proptosis. For clinical purposes,

Wright (1970) considered that an absolute reading in excess of 21 mm indicates proptosis. Males were found to have an average reading of 17 mm, females 16mm and children 14.5 mm but this variation is not statistically significant. The readings in both eyes are normally approximately equal in 25% of cases. The difference is about 2 mm in 6.6% and in the rest of the cases it is less than 2 mm (Duke Elder 1974).

Materials and Methods

All patients attending the General ENT outpatient department of the Institute of Oto Rhino Laryngology, Madras Medical College and Government General Hospital, Madras, India between August 94 and July 95 with signs of proptosis were taken up for this prospective

study. Clinically significant proptosis was regarded as a difference of 3 mm or more as measured by Luedde exophthalmometer. Twenty such cases were included in the present study. All the cases underwent a complete ENT examination and were sent for a detailed ophthalmic examination to the Institute of Ophthalmology Madras, to rule out conditions like pseudo proptosis and remeasurement of proptosis with Hertel exophthalmometer. Cases with malignancies were subjected to a CT scan to know the exact extent of the disease. Tests like angiogram and ultrasound of the eye were done for relevant cases. All cases underwent routine X-Rays for the paranasal sinus lesions.

It is probable that errors of upto 0.5 mm occur with all the exophthalmometers used. In this study, the relative exophthalmometry (comparison between the two eyes) is followed for all cases, except in bilateral proptosis where the absolute exophthalmometry (comparison with a known normal value) is used. The above measurements are for the displacement of the eye in an anterior direction.

RESULTS

The cases of proptosis were analysed with regard to sex distribution, age distribution, etiology, clinical symptoms and signs, and degree of proptosis.

Sex Distribution

Out of the twenty patients included in this study, eleven were males and nine females. Thus the males formed 55% and females 45% of the patients with proptosis.

Age Distribution

The patients age varied from 12 years to 65 years. There were five patients (25%) in the 11-20 age group, five (25%) in 21-30 age group, two (10%) in 31-40, three (15%) in 41-50, four (20%) in 51-60 and one (5%) in the 61-70 age group. It is seen, that patients be-

low the age of 30 formed 50% of the study group (Table No. 1).

Table No. 1
Age Distribution of Proptosis Cases

Age Group	No. of Patients
11-20	5
21-30	5
31-40	2
41-50	3
51-60	4
61-70	1
	20

Etiology

The etiology of exophthalmos formed an interesting part of this study. Infections accounted for only 5% (One patient) of the exophthalmos, while benign tumours and tumour like growths caused 45% (nine patients) of the lesions. The rest of the cases accounting for 50% were due to malignancies of different types as can be seen from Table No. II.

Table No. II
Etiology of Proptosis

Cause	No. of Patients	%
Ethmoidal malignancies	5	50%
Maxillary malignancies	4	
Maxillary and ethmoidal malignancies	1	
Mucocoele/pyocoele	5	45%
Fibrous dysplasia	2	
Frontal osteoma	1	
Juvenile nasopharyngeal Angiofibroma	1	5%
Orbital Cellulitis	1	

Among the malignancies, five patients had growths involving the ethmoidal region with or without the involvement of nose. Four had maxillary growths and one Non Hodgkins Lymphoma of the maxillary antrum and ethmoidal region. Thus proptosis in 25% of the cases of this study were due to ethmoidal growths, 20% due to maxillary growths and 5% due to the involvement of both regions.

Benign tumours and tumour like lesions accounted for nine cases in this study. Out of these, five were due to mucocoele /pyocoele, two due to fibrous dysplasia, one due to frontal osteoma and one Juvenile Nasopharyngeal Angiofibroma. Thus the incidence of these lesions causing proptosis are 25% mucocoele/pyocoele, 10% fibrous dysplasia, 5% frontal osteomas and 5% nasopharyngeal angiofibroma.

Of the five cases of mucopyocoeles, two were frontal in origin, two frontoethmoidal and one maxillary.

Clinical Symptomas and Signs

Analysing the clinical symptoms of the 20 patients in this study, it was found that the initial complaint of six patients (30%) were proptosis. Four (20%) did not complain of proptosis at all. These cases were found to have minimal proptosis (3 mm). The rest of the 10 cases had some other complaints in the beginning like headache, epistaxis, nasal obstruction or swelling over the eye, which was followed later by proptosis varying from 15 days to 6 months.

Among the six patients whose chief complaint was proptosis, two were due to frontal mucocoeles, two due to fronto ethmoidal growths, one due to frontal osteoma and one due to maxillary pyocoele. The other two cases of fronto ethmoidal mucocoeles initially complained of swelling over the roof of the eye followed by proptosis.

Among the malignant cases, only two of the ten gave proptosis as their initial complaint.

Among the four patients who did not complain of proptosis, two were suffering from fibrous dysplasia, one from nasopharyngeal angiofibroma and one from maxillary carcinoma. All these patients had minimal proptosis (3 mm) and probably did not notice the protosis due to other more threatening symptoms like recurrent nasal bleeding and facial swelling.

In addition to proptosis, seven patients (35%) also had other signs like chemosis, congestion, fixed pupil or restriction in movements of the eye ball. Of these, one patient was suffering from orbital cellulitis secondary to a boil near the upper eye lid and the rest (six patients) had malignancies. None of the other patients had any other sign other than proptosis.

Visual acuity was affected in ten patients (50%) varying from mild loss to total loss of vision. Eight of them had malignancies while one suffered from orbital cellulitis and one patient had maxillary pyocoele. The patient with pyocoele had a very mild loss of vision which recovered almost immediately after drainage of the pyocoele. Vision also improved in the patient suffering from orbital cellulitis after medical management.

Presentation of Proptosis

Analysis of the side of proptosis shows that ten patients (50%) had right sided proptosis and nine patients (45%) had left sided proptosis. Only one patient (5%) had bilateral proptosis.

Degree and Direction of Proptosis

The degree of proptosis was measured with a Hertle's exophthalmometer and was found to vary between 3 mm and 8 mm. Three millimeter proptosis was noticed in four patients, 4 mm in five, 6 mm in three, 7 mm in one and 8 mm proptosis in another patient (Table No. III). The patient with bilateral proptosis had 4 mm proptosis on the right side and 3 mm on the left side. There was no correlation between

Table No. III
Degree of Unilateral Proptosis

Proptosis in mm	No. of Patients
3	4
4	5
5	5
6	3
7	1
8	1

the degree of exophthalmos and the lesions, other than the fact that patients who came for treatment early had less proptosis than those who came later.

The direction of exophthalmos was also found to be as follows: Maxillary lesions pushed the eye upwards, outwards and laterally while ethmoid lesions pushed the eye outwards and laterally. Frontal lesions caused downwards, outwards and lateral displacement.

Discussion

In this study of twenty cases of Proptosis associated with ear, nose and throat lesions, proptosis was found to be more prevalent in the younger age group of 11-40 years (60%). Malignancies (50%) and benign tumour and tumour like lesions (45%) were the main cause in nearly 95% of the cases.

This is in contrast to the study made by Merchant (1993) on 22 patients where in 45.5%, the lesions were due to infections. Malignancies accounted for 41% and bleeding diathesis for 13.5%. From this it can be observed that only the percentage of proptosis due to malignancies are similar. In the series of Zaidi (1991) consisting of 17 patients, 41.25% of the proptosis were due to fungal infections, while malignancies accounted for 23.5% and benign tumour and tumour like lesions for 35.25%. It is said that the timely use of antibiotics has changed the relative frequency of orbital complications secondary to infections in the developed world. Probably, here in India also, the same trend has occurred, as the above findings closely correlate with the western reports.

It was observed that 25% of cases of proptosis were ethmoidal growths, 20% maxillary growths and 5% due to extensive involvement of both. Thus malignancies formed the single largest cause for proptosis in ENT practice. In Lederman's (1956) series, 52.3% of ethmoidal growths were associated with proptosis while, only 42.2% of maxillary antral growths accounted for proptosis. But overall, proptosis was seen more in maxillary antral growths only

due to its higher incidence. The results obtained in this study are also in conformity with the previous findings.

Majority of cases of proptosis due to benign tumours and tumour like lesions were due to mucopyocoeles. Fibrous dysplasia, frontal osteomas and nasopharyngeal angiofibromas were the other causes. In Zaidi's (1991) series of unilateral proptosis, six of the seventeen cases were due to benign lesions. Of these six, four (23.5%) were due to ethmoidal polypoidosis, one (6%) due to fibrous dysplasia and one (6%) due to Ringert's tumour. Thus the incidence of proptosis due to benign lesions and similar thought the causes are slightly different.

Correlating the lesions and the age it was found that all malignant cases were above the age of 40 (nine patients) except for one, who was a 25 year old male with a fronto ethmoidal growth. According to Batsakis (1979), 95% of patients with malignancy are older than 45 years of age. In this study, 90% of patients belonged to the age group of more than 40 years. The non malignant proptosis was found to occur in the younger age groups, with the oldest person being a 40 year old male.

It is also noted that in nearly 30% of the patients, proptosis was the first compliant particularly in patients with mucocoeles and osteomas. This compares with the findings in Harrison's (1986) series of 98 mucocoele patients, where proptosis was the commonest presenting symptom. In Atallah and Jay's (1981) series of 23 osteoma patients, six complained of proptosis and ten others had ocular complaints. It thus follows that in mucocoeles and osteomas, the main complaint of the patient is proptosis and in most of them it is their primary and only complaint. In malignancies affecting the fronto ethmoidal areas too, proptosis can be the primary complaint.

According to Larsson and Martensson (1954) 5% of the patients with malignancies gave ocular symptoms as the initial complaint. Their views are comparable to the result obtained

in the present study.

A small percentage of people (20%) never noticed the proptosis. This is probably because of the presence of other more disfiguring facial swellings or the presence of threatening symptoms drawing attention to it. In the presence of other eye signs like chemosis, congestion, restriction in ocular movements and decreased visual acuity, malignancy has to be always ruled out. The degree of proptosis varied from 3 to 8 mm as assessed through exophthalmometry and the only correlation between this and the lesions were that early cases had a lesser degree of proptosis than the advanced ones. The direction of proptosis was found to be more reliable in pin pointing the pathological site.

Conclusion

Though the incidence of proptosis in routine otorhinolaryngology practice is very low, when one does come across such a case there may be difficulty in diagnosis particularly for the beginners. A knowledge of atleast the important causes is the key to the problem. Another factor to be kept in mind is that in the presence of eye signs other than proptosis, malignancy should always be ruled out.

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